REMARKS

Claims 1, 21-26, and 28-35 has been amended and claim 37 has been cancelled. Claim 38 is newly added. Claims 1, 21-36, and 38 are currently pending in the application. Reconsideration and allowance of the pending claims are respectfully requested in view of the following:

Responses to Rejections to Claims – 35 U.S.C. §112

Claims 1, 21-22, 25-31, 33 and 37 are rejected to under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. This rejection is not applicable to the amended claims.

The Office Action supports its rejection of claims 1, 21-22, 25-31, 33 and 37 by arguing that the claim recitation "...a data driver applying the data voltages via the data lines and performing a column inversion" is not supported by the original disclosure. The Applicants respectfully disagree, and point to at least paragraph [0061] - [0063], which recite:

> "Let us consider an inversion performed by the data driver 500, which is referred to as a driver inversion." paragraph [0061]
>
> "For a dot inversion in a narrow meaning, i.e., 1x1 dot inversion, the polarities of the two subpixels are equal if P(i+j)=P(k+l), and on the contrary, the their polarities are opposite if P (k+l)≠P(i+j)." paragraph [0062]
>
> "For a column inversion, the polarities of the two subpixels are equal regardless of I and j if P(i)=P(j), and on the contrary, the their polarities are opposite if P(i)≠P(j)." paragraph [0063]

These paragraphs help to describe the issue the disclosure is addressing, discussed in the background at paragraph [0004]:

> "In such a four color subpixel LCD, since the number of the subpixels is even, the subpixels representing the same color (referred to as 'the same colored subpixels' hereinafter) appear by unit of even number in a row direction. Therefore, a data driving integrated circuit ('IC') performing a conventional Nx1 dot inversion that changes polarities of data voltages each row cannot give the polarity inversions to the same colored subpixels. That is, the same colored subpixels in a row are always supplied with the data voltages with the same polarity."

While paragraph [0004] only explicitly mentions dot inversions, the Applicants submit that one of skill in the art will recognize that a column inversion (described above in paragraph [0063] also changes polarities of data voltages in each row and will not be able to give polarity inversions to the same colored subpixels.

Paragraphs [0065]-[0091] then describe connections of pixels, gate lines, and data lines that will allow a data driver performing an inversion that changes polarities of data voltages for immediately adjacent subpixels in each row to give polarity inversions to same colored subpixels.

Thus, the Applicants submit that the claim recitations directed to a data driver applying the data voltages via the data lines and performing a column inversion is not new matter, and respectfully request that the rejection be withdrawn.

Claims 28-31 and 34-35 are rejected to under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. This rejection is not applicable to the amended claims.

The Office Action states that the variable 'N' in claim 22 renders the claim vague and indefinite. Claim 22 has been amended to remove references the variable 'N'. The Office Action also states that the word 'type' in the terms 'first type pair' and 'second type pair' in claims 28 and 34 and their dependent claims render an otherwise definite expression indefinite. Claims 28 and 34 and their dependent claims have been amended to remove the word 'type' from the terms 'first type pair' and 'second type pair'. Therefore, the Applicants respectfully request that the rejection be withdrawn.

Responses to Rejections to Claims – 35 U.S.C. §103

Claims 1 and 21-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawabe (U.S. Patent No. 7,113,159) (Sawabe). This rejection is not applicable to the amended claims.

Independent claim 1 recites, in part:

> "...a plurality of pixels arranged in a matrix, wherein each pixel includes a red subpixel, a green subpixel, a blue subpixel, and a white subpixel, each red subpixel, green subpixel, blue subpixel, and white subpixel has a switching element, and pixels are arranged in the matrix to provide a plurality of rows of adjacent pixels and a plurality of columns of adjacent subpixels; a plurality of gate lines for transmitting gate signals for turning on or off the switching elements, wherein one of the plurality of gate lines is located between each pair of immediately adjacent rows in the plurality of rows of adjacent pixels; and a plurality of data lines for transmitting data voltages, wherein one of the plurality of data lines is located between each pair of immediately adjacent columns in the plurality of columns of adjacent subpixels."

As the PTO recognizes in MPEP §2142:

> The Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the Examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

The USPTO clearly cannot establish a *prima facie* case of obviousness in connection with the amended claims for the following reasons:

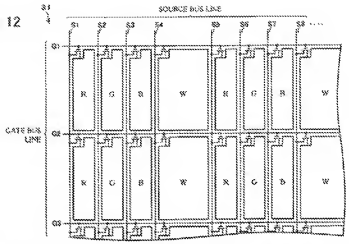
> 35 U.S.C. §103(a) provides that:
>
> [a] patent may not be obtained...if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.... (emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, the references, alone, or in any combination, do not teach a structure in which "... polarities of voltages applied to same-colored subpixels of two immediately adjacent pixels in a row are different from each other" in a matrix where each pixel includes four colors, as in Claim 1. The Office Action states that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to disclose a dot inversion methodology of the type recited in Claim 1 to Sawabe's device (see Office Action, page 9). The Office Action also goes on to describe different types of conventional inversion methods and states that selection of one of the conventional inversion methods would be "a design choice" (see Office Action, page 9).

Applicant disagrees with this assertion because the polarity scheme of Claim 1 differs from any of the conventional ones described by the Office Action. In a typical dot or column inversion, polarities of the applied data voltages are typically +-+-+-+-.... In a traditional three-colored-subpixel arrangement, subpixels having the same color adjacent pixels have different data voltage polarities with this inversion scheme. However, when there are four-colored subpixels as in Claim 1, the traditional +-+-+-+-... scheme does not result in polarities of voltages applied to same-colored subpixels of immediately adjacent pixels being different. To achieve that result, polarities of the applied data voltages are varied from the traditional scheme, for example as +-+--+-+.... This type of non-traditional inversion scheme results in subpixels of the same color that are located in immediately adjacent pixels of a row being connected to different gate lines to lessen crosstalk or flicker.

Sawabe discloses a matrix of pixels in rows and columns, with each pixel including a red pixel, a green pixel, a blue pixel, and a white pixel, in Fig. 12, reproduced below:

FIG. 12



Applying the conventional +-+-+-+-... inversion scheme to Sawabe's device would not have resulted "polarities of voltage applied to same-colored subpixels of two immediately adjacent pixels ... [being] different from each other" as recited in Claim 1. Hence, Claim 1 is not a simple combination of known elements.

Dependent claims 21-36 depend from and further limit independent claim 1 and are submitted as allowable for at least the reasons stated above.

Therefore, it is impossible to render the subject matter of the claims as a whole obvious based on a single reference or any combination of the references, and the above explicit terms of the statute cannot be met. As a result, the USPTO's burden of factually supporting a *prima facie* case of obviousness clearly cannot be met with respect to the claims, and a rejection under 35 U.S.C. §103(a) is not applicable.

Therefore, independent claim 1 and their respective dependent claims are submitted to be allowable.

In view of all of the above, the allowance of claims 1 and 21-36 is respectfully requested.

The amended claims are supported by the original application.

If any fees, including extension of time fees, are necessary, the extension of time is hereby requested, and the Commissioner is hereby authorized to charge any fees to Haynes and Boone, LLP's Deposit Account No. 50-5029.

The Examiner is invited to call the undersigned at (408) 331-1672 if a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted to the United States Patent and Trademark Office, via EFS-Web, on the date indicated below:

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